CALIFORNIA AGRICULTURAL EXTENSION SERVICE

CIRCULAR 82 REVISED JANUARY 1949

A SEPTIC TANK FOR FARM HOMES

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This Is What We Are Talking About . . . .

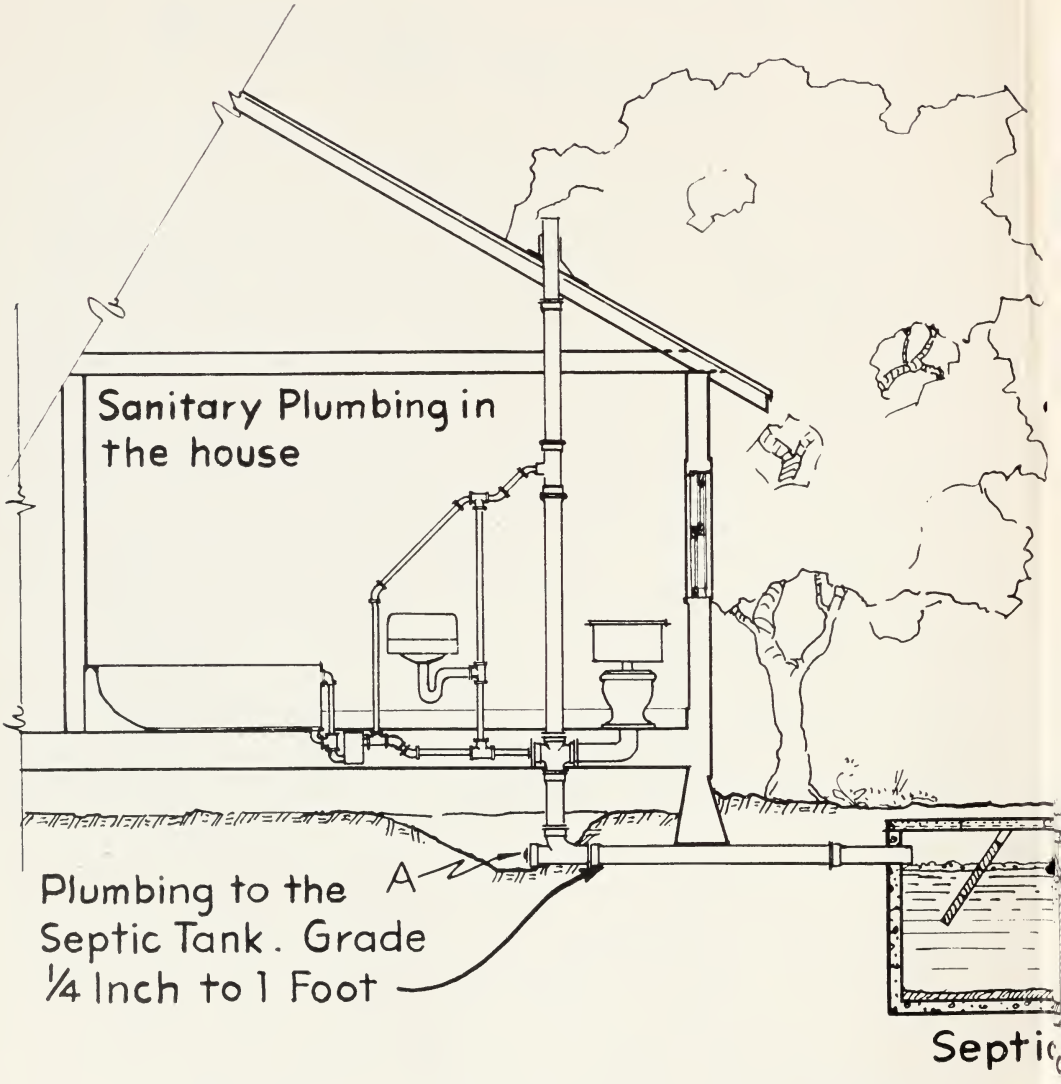
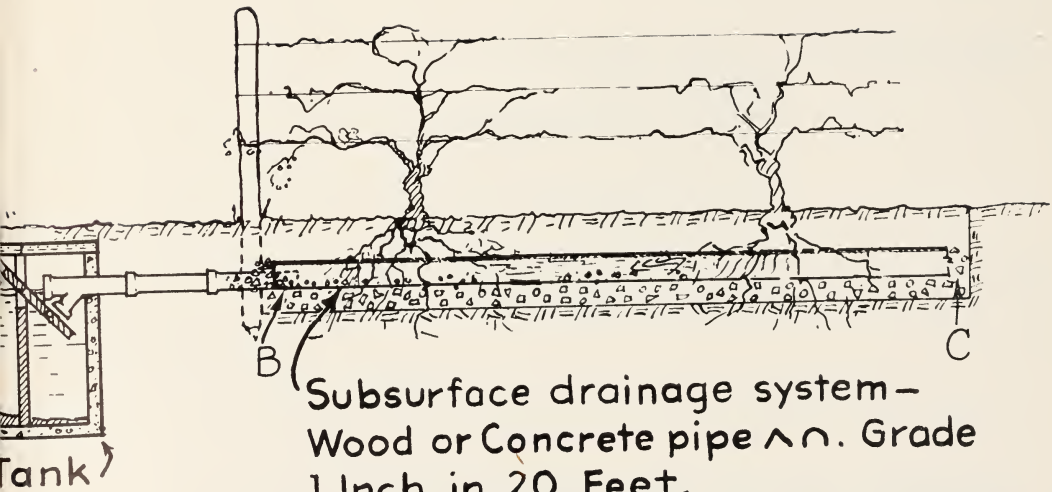


Fig. 1—Cross section o



he complete system.

. . . . And This Is What You Will Need

MATERIALS REQUIRED

MATERIALS	AMOUNT	DOLLARS	CENTS
CONCRETE MATERIALS	2 cubic yards crushed rock ¾-inch to 1-inch size.		
	1½ cubic yards sand.		
	16 sacks cement.		
	(If crushed rock is not available, 3½ cubic yards of clean, well-graded gravel, suitable for good concrete, may be substituted for the rock and sand.)	(	)
TILE	1 vitrified single-branch Y sewer tile, size 4-inch.		
	Vitrified bell-neck sewer tile, size 4-inch.		
	(Amounts of sewer tile and drainage line not given, as local conditions govern quantity required.)		
DRAINAGE LINE	2″ × 10″ and 2″ × 12″ heart common grade redwood or preservative-treated lumber, or half section of 12-inch concrete pipe.		
	1½ cubic feet of ¾-inch to 1½-inch rock for each foot of drainage line.		
	1 pound 20d nails for each 25 feet of trough.		
	(Amounts of drainage line not given, as local conditions govern quantity required.)		
BAFFLE BOARDS	1 piece 2″ × 10″ × 14′ rough common redwood or cedar.		
	2 pieces 2″ × 10″ × 10′ rough common redwood or cedar.		
	(6-inch and 12-inch widths may be substituted if 10-inch is not available.)		
COVER FORMS (common lumber surfaced one side)	2 pieces 1″ × 4″ × 12′.		
	2 pieces 1″ × 4″ × 10′.		
FORMS (common lumber surfaced one side)	Side walls, 21 pieces 1″ × 6″ × 10′.		
	End walls and braces, 8 pieces 1″ × 6″ × 12′.		
	2 pieces 1″ × 6″ × 8′.		
	Hanging boards and boxes, 1 piece 1″ × 6″ × 12′.		
	Baffle cleats and corner strips, 3 pieces 1″ × 3″ × 12′.		
	Long and center studding, 2 pieces 2″ × 4″ × 14′.		
	3 pieces 2″ × 4″ × 10′.		
	Corner studding, 2 pieces 2″ × 3″ × 10′.		
NAILS	2 pounds 8d common wire nails.		
	2 pounds 6d box nails.		
	TOTAL	$	

Take This with You When Pricing or Ordering Materials

Our Purpose . . . .

is to tell you how to build a concrete septic tank and drainage system for farm homes.

This circular has been reviewed by the State of California, Department of Public Health, Bureau of Sanitary Engineering.

Although the details of the septic tank described herein differ from those shown in the Health Bureau's Bulletin 56A, the design complies with the general principles; but the capacity, which is the most important feature, is the same.

If you decide to build the septic tank and sewerage system described in this circular **it is imperative that you check county ordinances first.** Do not proceed with any type of installation until you have checked with your county health department.

THE AUTHORS:

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Nearly three fourths of the farms in California have piped water into the house. There is little advantage to this unless it is combined with an adequate sewage disposal system. This system must be safe and operate effectively.

The combination of a septic tank and a subsurface drainage system is a satisfactory method of sewage disposal for most farm homes.

What about Leaching Cesspools?

The combination of a septic tank and a subsurface drainage system is generally safer than a leaching cesspool for absorbing sewage.

A leaching cesspool may be used, however, where the top soil is impervious to water, yet layers of sand and loam are under the top soil.

A leaching cesspool should never be used if there is a danger of contaminating wells or springs.

What Is a Septic Tank?

A septic tank is **only one unit** of a complete sewage disposal system. Other important parts are:

Sanitary plumbing in the house.

Plumbing to the septic tank.

The subsurface drainage system.

The above are shown in figure 1.

All sewage and waste water from the house plumbing fixtures flow into the septic tank.

A septic tank is a watertight container.

The chief function of the tank is to serve as a settling basin wherein the solids settle out of the liquids much as mud settles out of water.

Bacterial action starts shortly after the solids have settled. It breaks down the coarse material and reduces the volume of solid matter.

The partly clarified but still impure liquid "effluent" passes out of the tank through an outlet near its top and into the drainage system.

When once in the drainage system the effluent filters into the soil.

A Common Cause of Stoppage

Some finely divided particles of sewage are carried out with the effluent.

Some settle to the bottom of the tank.

In time those which settle to the bottom of the tank accumulate to a considerable depth. When this happens the finely divided particles of sewage pass out of the tank at an increased rate.

This causes stoppage in the drainage system.

Cleaning the Septic Tank

A septic tank must be cleaned out at intervals.

Frequency depends on the size of the tank and the amount of sewage.

Depth of sludge in the bottom of the tank—**not** the scum or mat which usually forms on the liquid surface—determines the need for cleaning.

CAUTION

Although the water entering the drainage system is almost clear, **it is not pure water.**

It must not be allowed to enter wells or other sources of domestic water supply.

Final purification takes place in the upper layer of soil both by filtering and bacterial action.

The effluent, when exposed to the open air as in ditches or pools, will give off foul odors. It will also be a source of contamination that may be carried by insects or animals.

Typhoid stools and other infectious matter should be disinfected before disposal through toilets.

TYPE OF TANK

The tank must be large enough, watertight, adequately baffled, accessible for cleaning, and constructed of materials which do not quickly decay or rust.

Simplicity of construction is desirable, but some form of baffling should be used to minimize agitation of the tank's contents and reduce the escape of solids through the tank outlet.

Ready-built septic tanks of different types and sizes are manufactured commercially and sold ready to install. They are made of steel, of wood, and of large-sized concrete pipe or vitrified clay pipe. In general, they have proved satisfactory when of adequate size and correctly installed. Their most common fault is lack of capacity.

The purchaser should be sure to select a size suitable for his needs.

Check County and Local Ordinances

Persons who plan to build septic tanks in counties which have ordinances governing septic tank design, capacity and installation should first confer with their County Health Department before proceeding with construction.

The septic tank described in this circular is larger but similar in design to the type of tank recommended by the University of California since 1917. Thousands of these tanks have given satisfactory service.

The sizes meet the recommendations of the California State Department of Public Health, Bureau of Sanitary Engineering, as outlined in their Special Bulletin 56A, which is used generally as a standard by the County Health officers for approval for FHA and VA loans.

A HOMEMADE SEPTIC TANK

The following describes a simple and satisfactory type of **concrete** septic tank. It may also be made of rot-resistant wood, brick or stone.

The inside measurements are 3 feet wide, 9 feet long, and 5 feet deep for the No. 1 tank. Its net liquid capacity is 108 cubic feet, the minimum recommended by the California State Department of Public Health.

One septic tank may serve two or more dwellings if the capacity is adequate for the number of people.

The following table from Special Bulletin 56A, State Department Public Health, gives specifications for 4 sizes of tanks.

Number of		Inside Measurements			Thickness of Concrete in Inches		
Tank	Persons	Width	Length	Depth	Ends	Floor	Top
1	4–7	3′	9′	5′	4	4	3
2	9	3′	10′6″	5′	4	4	3
3	12	3′6″	12′	5′	5	5	3½
4	15	4′	13′6″	5′	5	5	3½

This Is One Unit of the System . . . . A Half-Section View of the Concrete Septic Tank

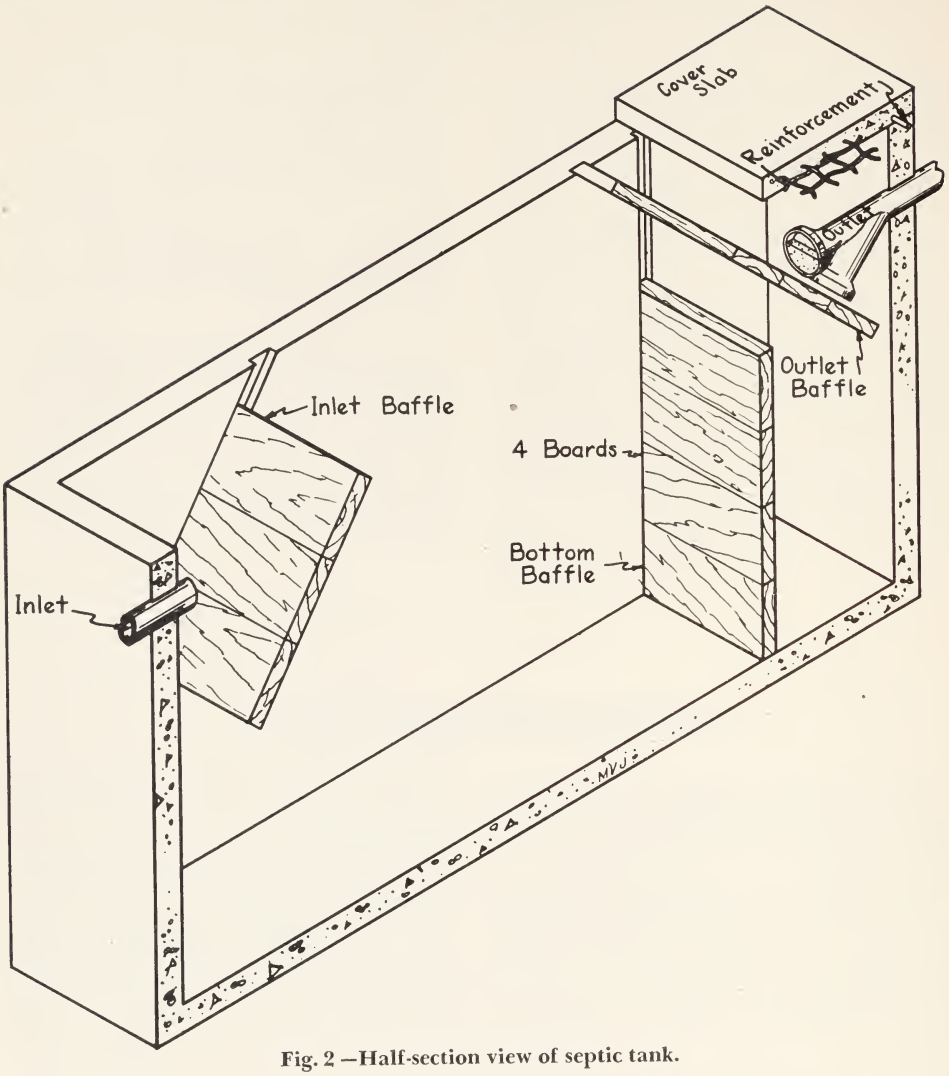

Fig. 2 —Half-section view of septic tank.

And . . . . . .

The Side View of the Tank. This Size Is For Not More Than Seven Persons . . . . . .

TANK LOCATION

The septic tank is normally located not farther than 50 feet from the house, but in some instances it may be as close as 10 feet.

The tank should not be placed under a foundation, permanent walk, or driveway. This might prevent its being uncovered for cleaning.

The tank is usually constructed so that the cover is flush with the ground or slightly lower. Accordingly, the top of the tank outlet line will be 12 to 16 inches below the ground level. This depth has proved satisfactory when favorable soil conditions for drainage exist.

A high water table at certain seasons, heavy clay loam, or hardpan near the surface may make it advisable to keep the top of the tank above ground level to provide a drainage outlet near the surface.

The Fall, or Grade, of the Sewer Pipe Line Is Important

The fall of the sewer pipe from the house plumbing fixtures into the tank should be not less than ¼ inch to the foot, which is 12½ inches in 50 feet. The fall must be taken into consideration when choosing a location for the tank.

If the tank is located a considerable distance from the house and the ground is level, the tank must be placed deep enough to provide sufficient fall for the sewer line. This means a deeper drainage system which, in general, is undesirable and more costly.

The Drainage Line out of the Tank

The grade for the drainage line need not be more than 1 inch in 20 feet, which is 2½ inches in 50 feet. Therefore, the use of a sufficient length of vitrified sewer pipe with cemented joints from the septic tank to the distribution lines makes it possible to:

Locate the tank near the house.

Permit installation of the drainage area nearer to the ground surface.

Provide a method whereby the drainage area may be located at a safe distance from a well or spring.

The sewer pipe may enter the tank on either side of the center in the end wall if that placing is more convenient.

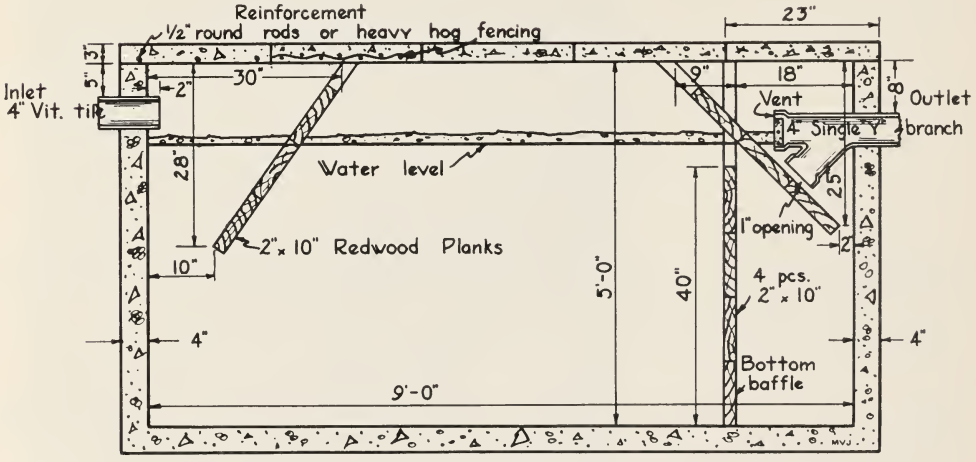

Fig. 3—Half-section side view of septic tank.

This Is the Wooden Form You Will Have To Build . . . .

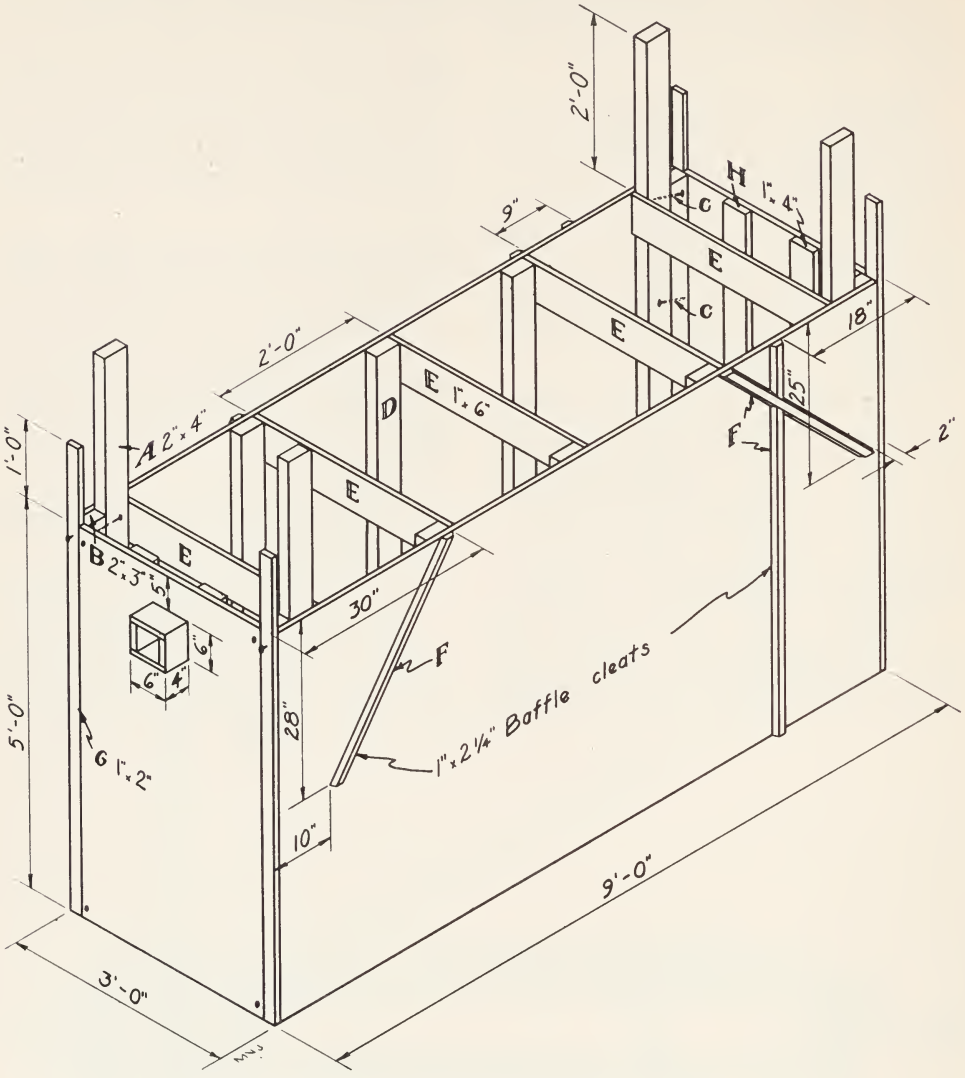

Fig. 4—Wooden form for concrete septic tank.

Build it carefully . . . pay close attention to construction details. You will avoid trouble later.

The above drawing is also reproduced on page 23. Cut it out for ready reference while reading or building the form.

DIRECTIONS FOR BUILDING

The following directions apply to the No. 1 tank for a family up to 7 persons.

For larger tanks, the dimensions should be increased in accordance with sizes given in the foregoing table.

Preparing for Excavation

After choosing the tank location make a rectangular frame. Two planks 3 feet 8 inches apart should be laid level and held in a flat position against stakes driven into the ground (fig. 5).

Nail two 1 × 6 inch boards across the planks to form a rectangular frame with inside dimensions of 9 feet 8 inches by 3 feet 8 inches.

This frame about the top of the hole prevents earth crumbling on the freshly poured concrete during construction. It also provides a working edge from which a plumb bob may be suspended to aid in digging perpendicular walls.

If the earth is such that it might cave in, the hole must be made larger to accommodate an outside form.

Under ordinary conditions the hole is dug to a depth between 5 feet 7 inches and 6 feet below the bottom of the frame. This places the tank cover 0 to 5 inches, and the top of the outlet pipe 11 to 16 inches, below the surface.

Local conditions, however, determine the depth of the tank.

The Forms

Forms are designed so that they can be easily removed in sections without damage.

They may be used repeatedly.

Many farm centers own sets of forms which they rent at a nominal charge to pay for the lumber and minor repairs.

Sets have been used twenty to thirty times.

Forms should be made of common lumber surfaced on one side. They should be oiled before use. This adds to their life and prevents concrete from sticking to the wood.

Figure 4 gives the dimensions for constructing the inside form.

Outside measurements should correspond to the inside measurements of the tank.

Fig. 5—Rectangular frame about the hole. The 2×10-inch planks are later used as baffle boards.

BUILDING.....

Side Panels

See figure 4. The sheathing, which may be 1 × 6 inches, is nailed firmly to the 2 × 4-inch studding—A and D.

The 1 × 2-inch baffle cleats—F—are then nailed on the side of the panels as grooves for the baffle boards. The cleats should be slightly beveled on the edges to insure easy removal of the side panels.

Figures 6 through 9 also show the construction.

Fig. 6—Squaring up and starting the side-wall form.

Fig. 7—The side-wall sheathing should be well nailed, and the boards drawn close together.

Fig. 8—Nail the 1 × 2-inch baffle cleats firmly in position after trimming the side-wall sheathing.

Fig. 9—Assembling side-wall forms and placing the 1 × 6-inch cross ties in the proper position.

Cross Braces

See figure 4. Ten 1 × 6-inch cross braces—E—five above and five below, hold the side panels to the proper width.

The five bottom braces should be 6 inches above the bottom of the form.

End Panels

See figures 4 and 10. The end panels, constructed as shown in figure 10, are held to the 2 × 3-inch studding—B—which fits against the studding—A—and the end of the side wall sheathing.

Two 8d common nails—C—at each corner hold the studding—B—in proper position.

Four 6d nails are enough to hold the end panel to the studding—B.

Corner Strips

See figure 4.

The corner strips—G—are held to the studding—B—by one small nail each, tacked near the top. These nails should be pulled out before the concrete is poured above them.

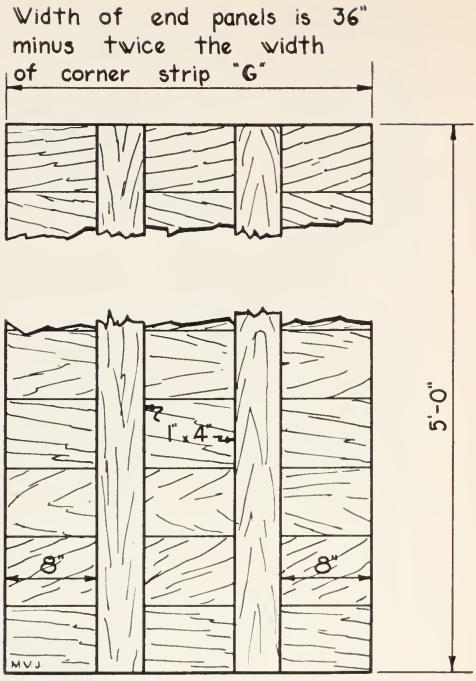

Fig. 10—End panel. Four 6d nails, one at each corner, hold the end panels to the 2 × 3-inch studding B, figure 4.

Hanging the Form

See figures 4 and 11.

As an aid to setting the form in position, the studding—A—should project 2 feet above the top edge of the wall sheathing. After being lowered into the hole, the form should be blocked up level to allow for a 4-inch bottom of concrete, and squared up in the hole so that all walls will be of the same thickness.

See figure 12.

Next, 1 × 6-inch hanging boards should be nailed firmly to the 2 × 4 studding—A—and to the 2 × 10-inch plank frame that was first placed about the top edges of the hole.

The blocking used to allow for a 4-inch bottom of concrete can now be removed, and the form is ready for the concrete.

Fig. 11—The completed form being lowered into the hole.

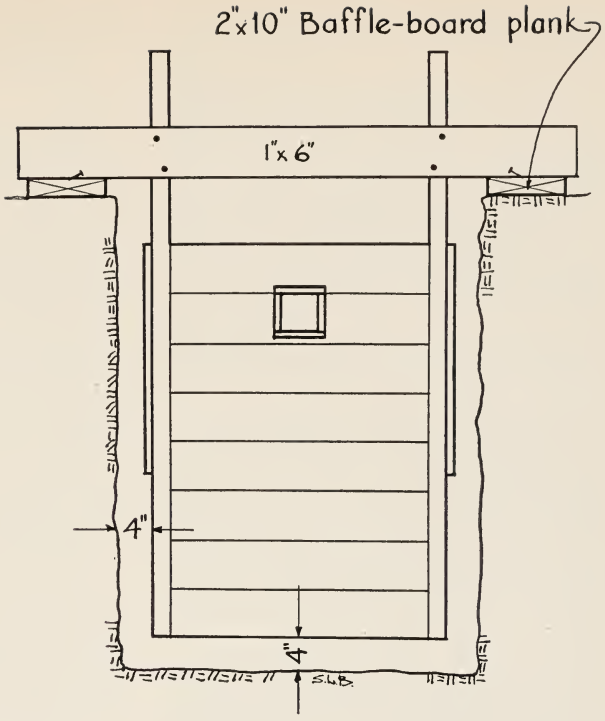

Fig. 12—End view of the completed form suspended in the hole.

CONSTRUCTION OF TANK

The tank should have 4-inch sides and a 4-inch bottom.

The top must be 3 inches thick and reinforced.

The Concrete Mix

A 1 : 2¼ : 3 concrete mixture is recommended. This means:

1: 1 sack or 1 cubic foot of cement.

2¼ : 2¼ cubic feet of sand.

3: 3 cubic feet of crushed rock.

Both the sand and the rock should be clean and free from organic matter.

The sand should vary from fine to ¼ inch in size.

The rock should vary from ½ to ¾ inch.

Clean, well-graded gravel may be substituted for the rock and sand. This mix calls for 1 sack of cement to 4½ cubic feet of gravel.

The Amount of Water Used

Enough water should be added to the dry mix to give the entire mixture a plastic consistency.

Too much water is bad. It reduces the strength of the concrete.

Use only enough water to make a workable mixture.

Pouring the Concrete

Tamp the concrete thoroughly while it is being poured. This will insure smooth watertight walls.

A 1 × 2-inch strip of lumber with a V-shaped point makes a good tamp for working the concrete into place.

CAUTION

Don't crowd the forms out of alignment by pouring too much concrete in one place.

Placing the Inlet and Outlet Boxes

See figure 4.

When the concrete is within 11 inches of the top at the inlet end of the tank form, and 14 inches at the outlet end, place the 6 × 6 × 4-inch boxes in their proper positions against the form.

Small nails driven into the form before it is lowered into the hole will help to locate the exact position of these boxes.

When the boxes are in position, continue pouring the walls.

True the top edge of the form with a trowel or block.

Pouring the Concrete Tank Floor

Since the walls are poured first, some concrete will work out from under the wall forms and spread over the bottom of the hole. This concrete should be tamped and smoothed into place along with the tank floor which is poured immediately after the walls.

The concrete floor should not extend any higher than the bottom of the forms. If it does it will make the forms difficult to remove later.

Constructing the Tank Cover

See figure 13.

Concrete slabs are used for the tank cover.

Level off some nearby ground as a work area for building a form.

Cut two 1 × 4-inch boards into lengths of 10 feet. Stake them on edge parallel to one another. They should be 3 feet 8 inches apart.

Cut the crosspieces. These should be 1 × 4's in lengths of 3 feet 8 inches.

Nail the crosspieces into position to form five rectangular compartments with inside dimensions 23 inches by 3 feet 8 inches.

Fill the bottoms of these compartments with fine damp earth or with sand.

Smooth to a level surface.

Leave 3 inches for the concrete.

Pour ¾ inch of concrete into the compartments over the earth or sand.

Immediately place the reinforcing in each compartment. This may be heavy hog fencing or three ½-inch steel rods.

Continue pouring the concrete until the compartments are filled.

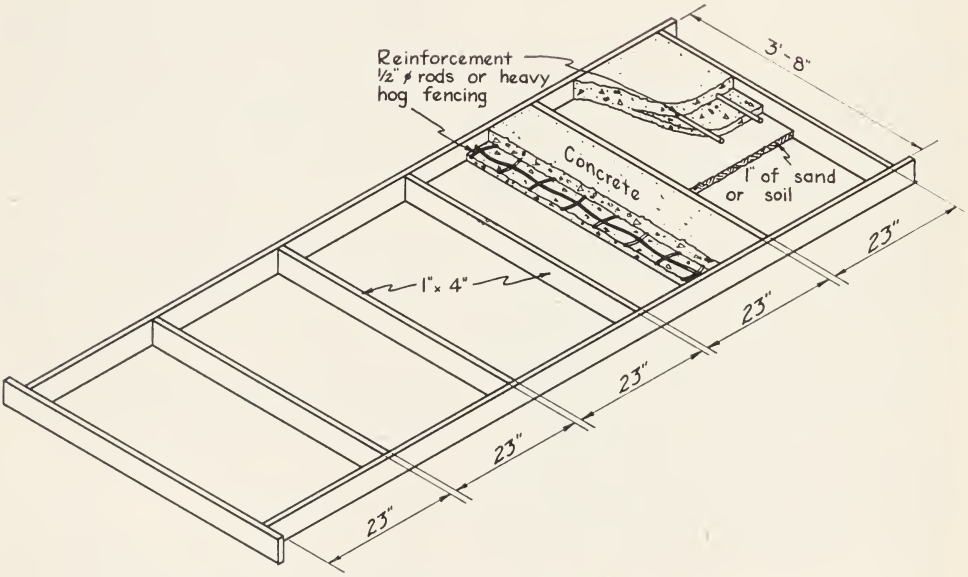

Fig. 13—Form for cover slabs.

Leave smooth and level with the top edge of the form.

Removing the Tank Forms

See figure 4.

After the concrete has taken its initial set, which is usually within 1 hour, the 1 × 2-inch strips—G—at the far corners may be tapped **lightly** with a hammer and drawn out. Their removal tends to prevent cracking of the concrete at the corners.

When the concrete has set 16 to 24 hours, the forms may be taken out in this order.

1. The 1 × 6-inch hanging boards shown in figure 12.
2. The cross braces—E.
3. The 2 × 3-inch corner studding—B. Take off by prying them inward after removing nails—C.
4. The end panels.
5. The side panels. These may be lifted out intact. Care should be taken not to break the concrete around the edges of the grooves into which the baffle boards are to be inserted.
6. The 6 × 6 × 4-inch boxes.

Curing the Concrete

The concrete should not be allowed to dry rapidly.

After the concrete has taken its initial set (usually within 1 hour) the exposed surfaces may be covered with wet sacks until the forms are taken out (usually 16 to 24 hours for the tank).

The tank should be kept wet for several days after the forms have been removed.

The cover slabs may be protected with wet sacks for a few hours and then kept wet for one week by flooding or using wet earth.

Completing the Tank

See figure 2.

Any porous areas in the concrete should be pointed up with a mortar made of equal parts of fine sand and cement.

The outlet Y branch should be inserted into position as shown. Use sand-cement mortar to secure a watertight joint in the wall.

The upper branch of the Y should be plugged with mortar, except for a small vent at the top.

The 2 × 10-inch baffle boards should be fitted loosely in the grooves.

Apply a small amount of mortar in the grooves at the ends of the top baffle boards. This will stop them from floating when the tank is filled with sewage.

The inlet pipe from the house projects 2 inches into the tank. It should be mortared in place.

The cover slabs may be placed in position after the concrete has been cured for at least one week. Install these so that the reinforcing steel is near the bottom.

Unless the tank is covered with several inches of dirt, the cover slabs should be sealed with a lean mortar so that they may be taken off more easily.

A lean mortar is a mixture of 1 part cement to 6 parts of sand.

Connecting the Tank

The pipe leading from the house to the septic tank should be laid to a grade of not less than ¼ inch to the foot. It should be embedded firmly in the ground.

Cast-iron pipe with tightly caulked joints is recommended, but vitrified clay or other approved sewer pipe may be used between the house foundation and the tank.

To clean out any mortar which might be in the line and obstruct the inflowing sewage, a swab made from a piece of burlap and a stick should be run through each length of pipe after the joint is cemented.

The plumbing fixtures and sewer line should be installed in accordance with standard sanitary plumbing practice.

CAUTION

The sewer pipe at the point of leaving the house should be kept as high as possible so that the sewer line leading from the house to the tank may be kept as near to the ground surface as possible. This avoids having to bury the tank too deeply.

It is not necessary to have a trap in the sewer line between the house and the tank, nor a vent in the septic tank.

A clean-out plug shown at A in figure 1 is recommended.

Mosquito Control

Vent stacks should be capped or plugged with 16-mesh copper screen cloth.

Tar paper or composition roofing should be laid over the cover slabs of the tank before earth is backfilled on the completed tank.

It has been found that plumbing vent stacks, and cracks in the backfilled earth over improperly sealed septic tank covers, have been places through which mosquitoes enter the tank and lay their eggs.

FINAL DISPOSAL OF THE EFFLUENT

Safe and trouble-free disposal of the effluent from the tank is of prime importance.

The following suggestions and recommendations are made in collaboration with the Bureau of Sanitary Engineering, California State Department of Public Health.

The means for the final disposal of the effluent depend upon local conditions.

The effluent must not be allowed to flow on the top of the ground, into open ditches or streams, nor within 75 feet of wells or springs. If the subsurface soil is waterlogged, then a distance of at least 200 feet from wells and springs is recommended.

There Are State Laws Governing Sewage Disposal—Violation Carries Heavy Penalties

State law forbids the disposal of sewage into deep drains or "sewer wells," or deep cesspools which reach to water strata that may be used, or that even are usable for domestic purposes. Violation of this law carries heavy penalties. Its purpose is to preserve the purity of underground water supplies, not merely for the present, but for the future as well. Nowhere is this more important than in the country.

In general, the recommended disposal of the effluent from septic tanks is by underground trenches. The drainage lines may be under lawns or among shrubs or trees. This serves as subirrigation.

The use of the sewage water by vegetation helps to prevent waterlogging, BUT the regulations of the State Board of Health forbid the use of sewage water to irrigate vegetables or edible berries.

The text of the regulations is as follows:

> Rule 3. Settled or Undisinfected Sewage Effluents.
>
> Effluents of septic tanks, Imhoff tanks or of other settling tanks, or partially disinfected effluents of sprinkling filters or activated sludge plants or similar sewages, shall not be used to water any growing vegetables, garden truck, berries, or low-growing fruits such that the fruit is in contact with the ground, or to water vineyards or orchard crops during seasons in which the windfalls or fruit lie on the ground. Such sewage, effluents, or any sludge or screenings shall not be permitted in ditches or pipes which may be used to irrigate vegetables, garden truck, berries, or low-growing fruit.
>
> However, such sewage may be used for irrigating growing vegetables grown exclusively for seed purposes in fields where crops are raised and watered not in conflict with this rule.
>
> Nursery stock, cotton, and such field crops as hay, grain, rice, alfalfa, sugar beets, fodder corn, cowbeets, and fodder carrots may be watered with such settled or undisinfected or partially disinfected sewage effluents provided that no milch cows are pastured on the land while it is moist with sewage, or have access to ditches carrying such sewage.

THE SEWER LINE FOR THE SUBSURFACE DRAINAGE SYSTEM

See figures 14 and 15.

A vitrified sewer line, at least 6 feet long, with cement joints is used to carry the effluent from the tank into the subsurface drain line.

A satisfactory type of drain line is an inverted V-trough, laid at a grade of 1 inch in 20 feet.

Regardless of the type of soil for drainage, 6 inches of rock or gravel ¾ inch to 1½ inches in size is placed beneath and at the sides of the trough.

This prevents gophers entering the drainage line.

The trough may be made of common-grade redwood or preservative-treated lumber, the planks being 2 × 10 inches and 2 × 12 inches.

The lumber should be of heartwood such as is used for irrigation flumes.

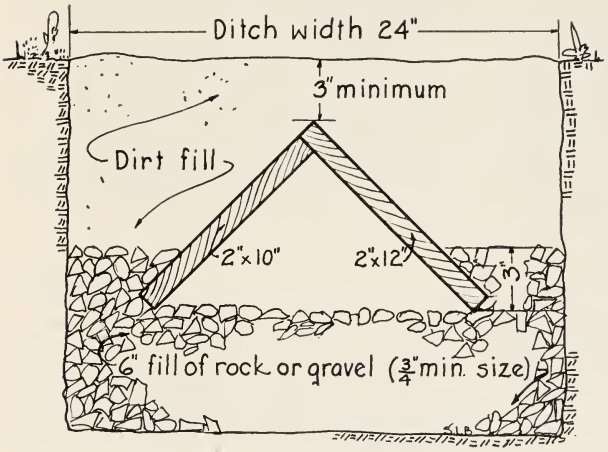

Fig. 14—Cross section of V-trough drain line.

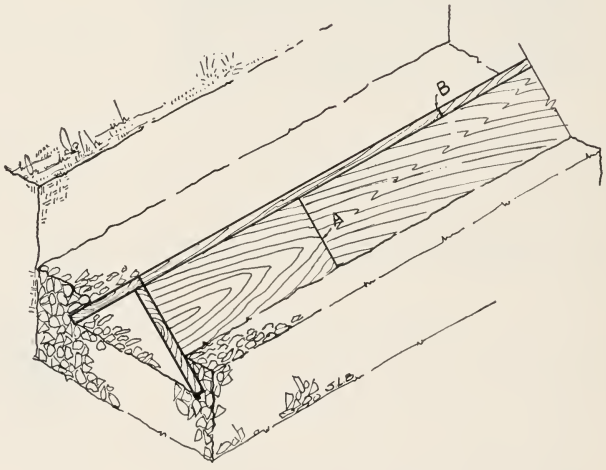

Fig. 15—View of V-trough in trench. Joints should be staggered as at A and B.

Concrete Pipe Also Used

See figures 16 and 17.

Half sections of 12-inch concrete pipe may be used instead of the wooden trough. They should be laid on 1 × 4-inch boards to prevent any one length of pipe from settling and causing stoppage in the drainage line.

See figure 1. The vitrified sewer line from the tank should extend at least 6 inches into the trough—B.

The opening between the sides of the trough and the pipe should be filled with gravel and mortar. This will stop dirt and gophers getting into the trough.

The extreme end of the trough—C—should be closed with a sufficient amount of gravel for the same reasons.

Length of the Trough

The length of the trough depends upon the amount of sewage and the water-absorbing nature of the soil. Under very favorable soil conditions, such as a course sand or gravel containing no fine particles, 10 feet of trough may be enough.

But, if the soil is "tight," or comparatively impervious, as much as 100 feet per person may be needed.

No definite rule can be laid down. But some idea can be had by observing how rapidly rain or irrigation water penetrates the soil, and by talking with others who have septic tanks in the immediate vicinity.

If a total length of more than 100 feet is needed, branch lines are recommended, none being more than 100 feet long.

When selecting the drainage area, choose one where additional lines can be installed in case the original line or lines prove inadequate.

If the drainage area is on a hillside, the drain lines should be run along a level contour, with the bottom of the trenches graded to give the required slope.

After all cemented joints have set firmly, run 150 to 200 gallons of water into the tank.

The tank is now ready for use.

The addition of a **"starter"** or bacteria is not necessary.

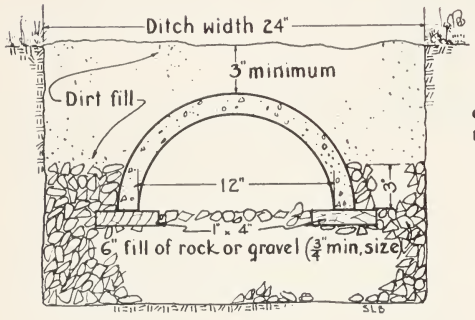

Fig. 16—Cross section of half-section concrete pipe drain line. Note boards on which the pipe rests.

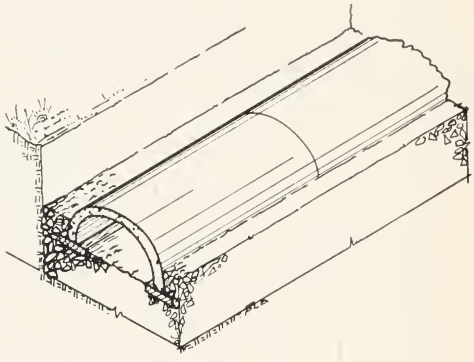

Fig. 17—Half-section concrete pipe in trench.

MAINTENANCE OF THE SEWERAGE SYSTEM

Careful attention to construction details reduces the possibility of future trouble in the septic tank sewerage system.

Use of Disinfectants

Moderate amounts may be used. Large amounts of disinfectants or cleaning agents are detrimental to bacterial activity in the tank.

Grease Traps

If waste fats and grease are deposited with the garbage, a grease trap need not be installed. However, a trap may be desirable if an excessive amount of greasy water is discharged into the tank.

Grease trap designs are given in U. S. Dept. Agr. Farmers' Bulletin 1950: 1–30. 1944 under the title "Sewage and Garbage Disposal on the Farm" by J. W. Rockey and J. W. Simons.

Stoppage

The most common complaint concerning sewerage systems is that waste water leaves the plumbing fixtures slowly, or that toilets overflow. This is caused by stoppage in the pipe, tank, or drain line.

Here is the way to locate the stoppage and to remedy it.

Open drain line near the tank.

If, when the line is opened, water rushes from the drain line, then the trouble is in the drainage line.

If the soil around the line is saturated along the length of line (not because of a natural high water table), then the drain is plugged, or more drain line is needed.

If there is no rush of water when the line is opened, the stoppage is at the inlet of the tank or in the sewer line between the house and the tank. To correct this:

1. Remove the second cover slab from the inlet end of the tank.

2. Remove the scum from in front of the inlet baffle.

3. Probe around the inlet.

If this does not clear up the stoppage, then the trouble is in the sewer line.

If this be the case, run heavy wire, a rod, or a hose with nozzle jetting water, through the sewer line.

If there are no clean-out plugs in the sewer line, break a joint to gain entrance.

After the line is cleaned, repair the broken joint with mortar.

Sometimes Pipe Must Be Relaid

In many disposal systems 4-inch drain tile has been used for the drainage line.

In time the soil about the joints of the tile becomes impervious. If this happens often, the drain pipe should be relaid in a bed of coarse gravel; or the open-bottom drain line described in this circular should be substituted for the 4-inch tile line.

Cleaning the Tank

The authors studied the performance of a number of septic tanks that had been in use for three to ten years.

The results of this study, which covered the major portion of California, indicated that sludge accumulated in the bottom of the No. 1 tank at the rate of about 1 inch per person per year.

Due to sludge accumulation the capacity of the tank gradually diminished. This results in increasing quantities of sludge being discharged into the drain line. In time, this causes stoppage in the drainage system.

On the basis of the study, it is recommended that the No. 1 tank described in this circular be cleaned in 5 years if 6 persons are in the household, or in 10 years for an average of 3 persons.

How to Clean the Tank

1. Remove the second and third cover slabs from the inlet end.

2. Remove the scum or mat with a shovel.

3. Remove the liquid and the sludge.

The liquid and a portion of the sludge may be removed by a pump if the contents are agitated during pumping.

Allowing water to flow into the tank aids in pumping.

Bailing the liquid is often the practical method.

A Good Bailing Pail

A 5-gallon oil can makes a very satisfactory bailing pail (fig. 18). Strap iron is bolted or riveted to the edges about the top and on two sides of the can to reinforce it. This also provides a suitable support for the swinging metal handle. The wooden handle should be at least 6 feet long.

Disposal

Disposal is simple. Bury the scum, and run the liquid into a trench that can be backfilled after a few hours.

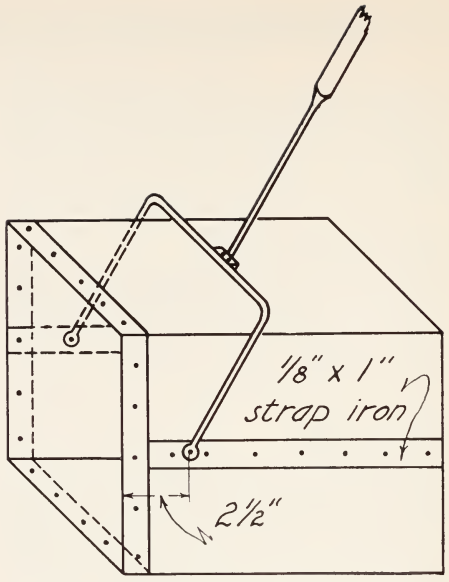

Fig. 18—Home-made bailing pail.

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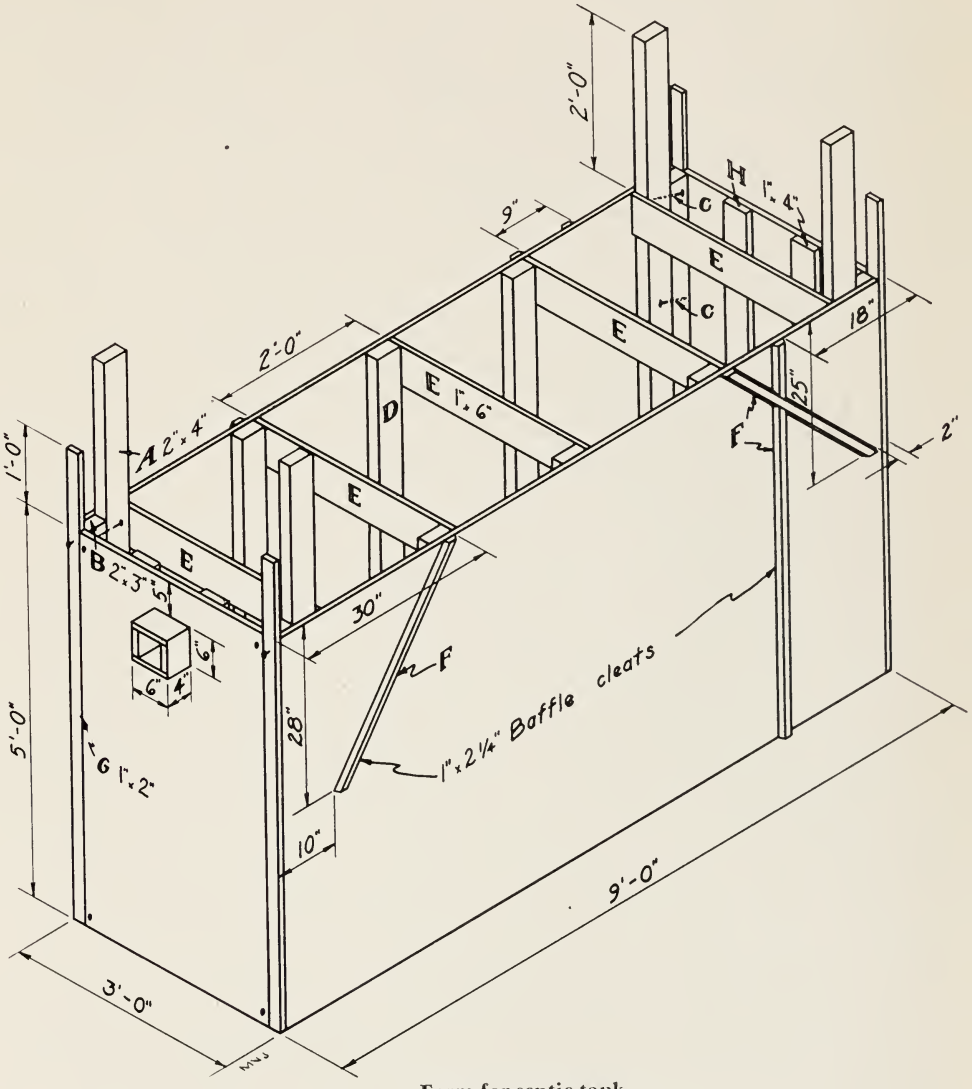

Form for septic tank.